Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_

**Must-Knows: Unit 12 (Ecology)**

Ms. Ottolini, AP Biology

**Test Format:** 18 multiple choice questions, 2 calculations questions ***(use your Population Growth Equations Worksheet to study for this portion of the test!)***

**Topic #1: Ecosystems**

**Learning Target #1:** I can identify the different levels of ecological organization and provide examples of biotic and abiotic factors in an ecosystem.

**Learning Target #2:** I can distinguish between the two types of ecological succession—primary and secondary.

**Learning Target #3:** I can describe the strategies that organisms use to regulate their use of free energy (ex: endothermy and ectothermy).

**Learning Target #4:** I can describe the effects of various human activities (ex: introduction of invasive species) and geological / meteorological events (ex: El Nino) on ecosystems.

1. What is ecological succession? Why does ecological succession occur?
2. What is the difference between primary and secondary succession?
3. What are invasive species? List some ways that invasive species can be harmful to communities to which they are introduced.

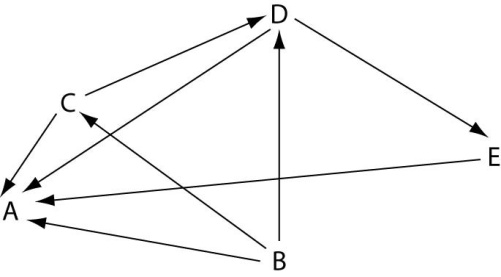
**Topic #2: Communities**

**Learning Target #5:** I can explain how energy is transferred between different trophic levels in a community (i.e. analyzing and creating food webs).

**Learning Target #6:** I can compare / contrast the different types of symbiotic relationships between species in a community (ex: mutualism, commensalism, parasitism, predation, competition)

**Learning Target #7:** I can describe the effects of changes to a community (ex: loss of a keystone species).

1. How is the fundamental niche for an organism different from its realized niche?
2. How do niches and resource partitioning relate to the competitive exclusion principle?
3. What is trophic efficiency, and why is it so low? Relate your answer to the second law of thermodynamics.
4. How is gross primary production different from net primary production?
5. How do species richness and species abundance relate to species diversity? Why is it beneficial to have high species diversity in a community?
6. What is the difference between a dominant species and a keystone species?



1. In the food web to the right, which organism(s) could be...
2. A producer? How do you know?
3. A primary consumer? How do you know?
4. A carnivore? How do you know?
5. A decomposer? How do you know?

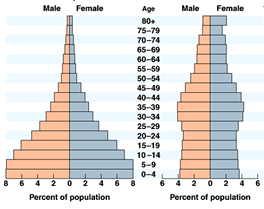
**Topic #3: Populations**

**Learning Target #8:** I can provide examples of communication between members of a population that enhances survival and reproductive success.

**Learning Target #9:** I can describe patterns of growth within populations.

1. With what types of organisms (ex: plants or animals) might the quadrant technique be used to estimate the size of a population? Why?
2. With what types of organisms (ex: plants or animals) might the mark and recapture technique be used to estimate the size of a population? Why?
3. In the first phase of a mark and recapture experiment, 35 birds are captured, tagged, and released into the environment. In the second phase, 25% of the birds captured have the tag? What would be the estimate of the total population size?
4. What is the difference between exponential growth (J curve) and logistic growth (S curve)? Which type of growth is most reasonable to expect in a REAL population with a set amount of resources?
5. What is the difference between a type III survivorship curve / r-selected population and a type I survivorship curve / k-selected population?
6. Explain is happening to each of the populations in the chart below.

|  |  |  |
| --- | --- | --- |
|  | **Graph** | **Description** |
| A |  |  |
| B |  |  |
| C |  |  |

1. What can be said about the growth of the populations pictured in the age structure diagrams to the right?
2. What is the difference between a density-independent and a density-dependent limiting factor? Provide an example of each.